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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/709,719

05/25/2004

Ming Tang

13114-US-PA

3718

31561

7590

12/19/2006

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE

7 FLOOR-1, NO. 100

ROOSEVELT ROAD, SECTION 2

TAIPEI, 100

TAIWAN

EXAMINER

WEISS, HOWARD

ART UNIT

PAPER NUMBER

2814

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

12/19/2006

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



Attorney's Docket Number: 13114-US-PA

Filing Date: 5/25/2004

Continuing Data: RCE established 6/22/2006

Claimed Foreign Priority Date: none

Applicant(s): Tang

Examiner: Howard Weiss

***Claim Objections***

1. The amendment to the claims filed on 10/27/2006 does not comply with the requirements of 37 CFR 1.121(c) because deleted text is not shown. Amendments to the claims filed on or after July 30, 2003 must comply with 37 CFR 1.121(c) which states, in part: " ...*The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived...* " Also see ~~MEP~~ <sup>MEP</sup> 714 II.C(B)

Since the reply filed on 10/27/2006 appears to be *bona fide*, the claims as submitted have been entered into the case file and the following Office Action is based upon this version of the pending claims.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
3. Claims 34 to 36, 38, 43, 46 to 49, 52 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al. (U.S. Patent No. 5,252,845).

Kim et al. show all aspects of the instant invention (e.g. Figures 2 to 4) including:

- forming a deep trench capacitor in a substrate 1
- defining an active area with an isolation area and a semiconductor pillar (that part of the substrate between sidewall spacer 6) formed exclusively from said substrate and having four sidewalls and a top surface
- forming a buried strap 13 via out-diffusion of dopants from inner electrode 9 and in a lower portion of said pillar
- filling with insulating material 6 and removing said insulating material to expose the sidewalls of said pillar as claimed (see Figures 2f and 2g and Column 3 Lines 27 to 37)
- forming a gate dielectric 14 on said pillar and a word line 15,20 on at least three sidewalls of said pillar
- forming a source/drain region 16 on said pillar and a bit line 17,22 connected to said source/drain region
- using a masking layer 8 which overlap the capacitor
- said word line 20 (Figure 4) formed intersecting with other pillars adjacent to the semiconductor pillar

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
5. Claims 39 to 42, 44, 45, 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. and Hisamoto et al. (IEDM 91).

Kim et al. show most aspects of the instant invention (Paragraph 3) except for using the word line as a mask in forming the device and the top of the word line is lower than the top of the pillar. Hisamoto et al. teach (e.g. Figure 1) to use the word line as

a mask and to have the top of the word line lower than the top of a pillar to reduce noise due to minority carriers (see last paragraph). It would have been obvious to a person of ordinary skill in the art at the time of invention to use the word line as a mask and to have the top of the word line is lower than the top of the pillar as taught by Hisamoto et al. in the process of Kim et al. to reduce noise due to minority carriers.

### ***Response to Arguments***

6. Applicant's arguments filed 6/22/2006 have been fully considered but they are not persuasive. In reference to the word line formed on the sidewalls of the pillar, the word lines of Kim et al. (**20** in Figure 4 and **15** in Figures 2 and 3) are formed on the sidewalls of the semiconductor pillar. In reference to the pillar in Kim et al., it is formed from the silicon substrate **1** as shown in Figure 2b. In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

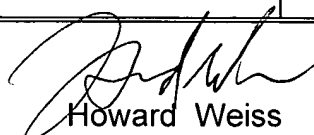
8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).
9. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on **(571) 272-1705**.

Art Unit: 2814

11. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/243	thru 12/12/06
Other Documentation: none	
Electronic Database(s): EAST	thru 12/12/06

HW/hw  
12 December 2006

  
Howard Weiss  
Primary Examiner  
Art Unit 2814